### (19) World Intellectual Property Organization International Bureau





# (43) International Publication Date 29 November 2001 (29.11.2001)

## **PCT**

# (10) International Publication Number WO 01/91290 A1

(51) International Patent Classification7: H03H 3/02, 9/58

(21) International Application Number: PCT/GB01/02293

(22) International Filing Date: 23 May 2001 (23.05.2001)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data: 0012437.0

24 May 2000 (24.05.2000) GB

(71) Applicant (for all designated States except US): CRAN-FIELD UNIVERSITY [GB/GB]; Cranfield, Bedfordshire MK43 0AL (GB).

(72) Inventors; and

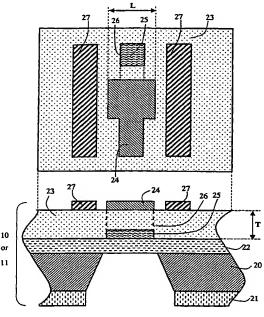
(75) Inventors/Applicants (for US only): WHATMORE, Roger, W. [GB/GB]; 21 Tweed Drive, Bletchley, Milton Keynes MK3 7QR (GB). KIRBY, Paul, B. [GB/GB]; 31

Swallow Close, East Hunsbury, Northampton NN4 0QL (GB). SU, Qingxin [CN/CN]; P.O. Box 132, No. 25 Gao Xin Road, Xi'an 71005 (CN). KOMURO, Eiju [JP/JP]; 6-2-10-504 Yakuendai, Funabashi-shi, Chiba 276-0077 (JP).

- (74) Agent: BARKER BRETTELL; 138 Hagley Road, Edgbaston, Birmingham B16 9PW (GB).
- (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.
- (84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian

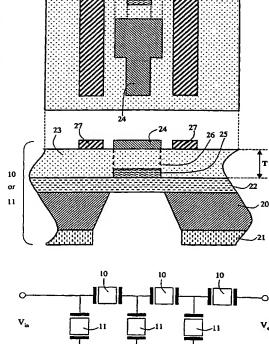
[Continued on next page]

(54) Title: IMPROVEMENTS TO FILTERS



(57) Abstract: An electric filter comprises a plurality of thin film bulk acoustic resonants (10, 11) arranged in series and in parallel which have electrodes (24, 25) of different working area (L) and optionally a piezoelectric layer (23) of different thickness (T).





# WO 01/91290 A1



patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

#### Published:

with international search report